

INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT FOR CLASSROOMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included: Provision of materials, installation and testing of:
 - 1. Video Display Mounting Hardware
 - 2. Loudspeakers
 - 3. Video Source Equipment.
 - 4. Video Distribution Equipment
 - 5. Video Display Equipment
 - 6. Wire and Cable
 - 7. Architectural Connectivity

1.2 RELATED SECTIONS

- A. Contents of Division 27, Communications and Division 01, General Requirements apply to this Section.
- B. Reference Division 11, Projection Screens.

1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by Section 27 00 00, Communications Basic Requirements and Division 01, General Requirements.
- B. In addition, meet the following:
 - 1. BICSI/INFOCOMM AV Design Reference Manual.
 - 2. ANSI/INFOCOMM 1M-2009 Audio Coverage Uniformity in Enclosed Listener Areas.
 - 3. ANSI/INFOCOMM 2M-2010 Standard Guide for Audiovisual Systems Design and Coordination Processes.

1.4 SUBMITTALS

- A. Submittals as required by Section 27 00 00, Communications Basic Requirements and Division 01, General Requirements.
- B. Provide shop drawings showing installation instructions, block wiring diagrams, component interconnections, custom faceplate layouts with labeling, device locations, and literal descriptions.

1.5 QUALITY ASSURANCE

- A. Quality assurance as required by Section 27 00 00, Communications Basic Requirements and Division 01, General Requirements.
- B. Contractor Qualifications: Minimum of five years experience in the design, installation, testing and maintenance of commercial audio-video systems.
- C. Must employ at least one full-time InfoCOMM Certified Technology Specialist (CTS) who is involved in reviewing work performed by Contractor on this project.
- D. Maintain a local service facility which stocks spare devices and/or components for servicing systems.

1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Section 27 00 00, Communications Basic Requirements and Division 01, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Extron Electronics
- B. Or approved equivalent.

2.2 APPROVALS AND SUBSTITUTIONS

- A. Provide products as specified without exception, unless approved in writing prior to bidding.
- B. Remove and replace non-compliant products installed as part of this Contract. Contractor to bear costs associated with removal and replacement of products

2.3 VIDEO DISPLAY MOUNTING HARDWARE

- A. Projector Mounting Bracket:
 - 1. +/- 4-degree roll adjustment.
 - 2. +/- 25-degree pitch adjustment.

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3. 50-lb weight capacity.
4. Chief Manufacturing RPA series, or approved equivalent.

B. Mounting Accessories:

1. Devices consist of plates, columns, clamps, brackets and adapters.
2. All devices of steel construction using National Pipe Thread (NPT) and American National Standards Institute standards (ANSI).
3. Examples of Components Required:
 - a. 8-inch ceiling plate with attached adjustable 1-1/2-inch NPT (column). Chief Manufacturing CMA-100.
 - b. Angled ceiling adapter. Chief Manufacturing CMA-395-395.
 - c. Adjustable extension column. Chief Manufacturing CMS Series.
 - d. Fixed extension column, 1-foot length. Chief Manufacturing CMA-012
 - e. C-Clamp. Chief Manufacturing CMA362.

2.4 SOUND ENHANCEMENT SPEAKER

A. Ceiling-Mounted Loudspeaker:

1. Omni-directional.
2. 40-W power handling.
3. Cetacea Sound Astronaut CL.

2.5 VIDEO DISTRIBUTION EQUIPMENT

A. HDMI Switcher:

1. 2-input, 1-output HDMI video switcher.
2. Supports HDTV 1080p/60 and PC resolutions up to 1920x1200.
3. HDMI 1.3 compatible.
4. HDCP compliant.
5. Input cable equalization at each input.
6. Auto-input switching.
7. Extron Electronics SW2 HDMI LC, or approved equivalent.

2.6 VIDEO DISPLAY EQUIPMENT

A. Video Projector:

1. 2700 ANSI lumens.
2. 4:3 aspect ratio.
3. Up to 1080p resolution.
4. HDMI or VGA video inputs.
5. RS-232 control port.
6. Hitachi CP-X2530WN.

2.7 WIRE AND CABLE

A. Acceptable Manufacturers:

1. Extron
2. Or approved equivalent.

B. Cable and Adapter Types:

1. Microphone-level and line-level audio cable 22 AWG, stranded conductors, shielded. Plenum-rated as required.
2. Loudspeaker-level cable, 18 AWG, stranded, 2 conductors. Plenum rated as required.
3. High resolution RGBHV cable, 25 AWG, five coaxial conductors. Plenum-rated as required.
4. High-performance HDMI cable, 22 AWG minimum, supports data rates up to 4.95 Gbps; HDMI 1.3 Category 2 compliant, pre-terminated with male connectors. Plenum-rated as required.

2.8 ARCHITECTURAL CONNECTIVITY

A. Custom A-V Outlet Plates:

1. Flush-mounted, stainless-steel faceplates.
2. Jack/connector configuration as shown on Drawings.
3. Size as shown on Drawings, to fit in industry standard back box unless specifically noted otherwise.
4. Label jacks and connectors as indicated on Drawings, with 1/4-inch Arial-type font.

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which audio-video equipment will be installed. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Equipment Mounting Hardware:
 - 1. Video Display Mounting Hardware:
 - a. Position projector mounting hardware according to the Drawings, fastened to structure.
 - b. Size extension columns such that the projector lens aligns to the top of the projection screen.
- B. General:
 - 1. Performance Requirements:
 - a. Coordinate with Division 26, Electrical for installation of electrical service, raceways, conduit, back boxes, and the like, necessary to support the systems specified.
 - b. Conceal wiring in walls and ceiling spaces during construction.
 - c. Determine requirements for plenum-rated cable. When doubt exists, seek determination in writing by AHJ prior to ordering.
 - 2. Install complete system in strict accordance with manufacturer's recommendations. Complete electrical connections to all system components.
 - 3. Install wiring in raceways where routed through inaccessible areas. Use J-hooks for cable installed in areas with accessible ceilings.
 - 4. Install equipment so it is held firmly in place. This includes projectors, loudspeakers, control equipment, conduit, etc.
 - 5. Label outlets, etc. in a logical and readable manner. Labels are to correspond with connection designations on shop drawings.
 - 6. Label cables using a machine printed label, at each end of the cable within 12-inches of the termination point. Handwritten labels are not permitted. Labels to correspond with cable designations on shop drawings.
 - 7. Do not install electronic equipment in any space until other work within the space has been completed, to prevent dust, dirt, debris, etc. from damaging equipment.
 - 8. Mount modules for modular equipment in strict accordance with manufacturer's specifications.
 - 9. Store loose devices and cables in Owner-approved location.

3.3 WIRING

- A. Provide system wiring in accordance with good engineering practices as established by Telecommunications Industry Association (TIA), Electronic Industries Alliance (EIA), and NEC. Meet established state and local electrical codes.
- B. Maintain at least 4-inch separation from electrical power cables.
- C. Dress cables in a neat and workmanlike manner with velcro ties.

3.4 INSPECTION AND TEST UPON COMPLETION

- A. Verify that projectors are adjusted such that the projected image fills the projection screen at the center of its zoom range.
- B. Warranty materials and installation to be free of defects in material and workmanship after final acceptance of installation and test per Division 01, General Requirements.
- C. Upon completion of the installation, furnish copies of complete operational instructions, complete with record drawings. Include part numbers and names, addresses, and telephone numbers of parts source. One hard copy and two digital copies on CD required for materials.
- D. Nothing contained in this Section to be construed to relieve the Contractor from furnishing a complete and acceptable system in all its categories. The Architect will reject any materials or labor that are or may become detrimental to the accomplishment of the intents of these Specifications.

3.5 TRAINING

- A. Provide Owner with manufacturer's operating instructions.

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- B. Provide representatives to instruct the Owner's personnel in the operation of each system, its components, and equipment.
- C. Demonstrate to the Owner all system features and operations.
- D. Provide comprehensive training for the designated Owner representative for the operation, maintenance, and troubleshooting of the systems.

3.6 CLEAN-UP

- A. Remove unused materials and debris from the work and storage areas. Leave areas in an undamaged and acceptable condition.
- B. Save the shipping boxes for the Owner in case of need to return product for service.

END OF SECTION